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Noviciæ Indicæ XI.—*Two additional species of* Lagotis.—*By* D. Prain.

Plates I and II.

[Received and read, 1st April.]

Lagotis is the only Indian genus of the natural order *Selagineæ*. It is almost purely alpine in Indian territory; only two of the truly Himalayan forms (*L. glauca* var. *sikkimensis* and *L. spectabilis*) come as low down as 11,000 feet. A species that extends from Armenia to Afghanistan, but that has not yet been collected within the British border though it has been found in Waziristan just beyond it, comes as low down as 6,000 feet; most of the Himalayan forms, however, occur at from 15,000—18,000 feet elevation.

The forms that have been recognised as distinct by different writers have varied considerably in number and extent. This is owing to the difficulty of finding characters that are constant either in the flowers or in the leaves and stems. To such an extent does this variability go that in 1881, Mr. Maximowicz [*Bull. Ac. Petersb.* xxvii. 522 *et seq.*] published a review of the genus in which, while he tentatively recognised five more or less distinct forms, he expressed the opinion that probably future taxonomists would be constrained to reduce the number of legitimate species to two only.

In making this prediction it is clear that the material of our Himalayan forms at his disposal had been all too scanty and it is evident also that, in making his enumeration, Mr. Maximowicz had overlooked a paper in the Society's *Journal* [vol. xxxix. (1870)] wherein the late Mr. Kurz described two new forms belonging to the genus. One of these must undoubtedly have fallen within the limits of *L. glauca* as that species has been understood by Mr. Maximowicz; the other is, however, so remarkable and so distinct that there is every reason to suppose that Mr. Maximowicz would have accorded it the specific rank claimed for it by Mr. Kurz.

In the *Flora of British India*, vol. iv, Sir Joseph Hooker has given an excellent account of the Indian forms reported up to August 1885. Here the validity of one of Mr. Kurz's species (*L. globosa*) is incontrovertibly established; one of Dr. Ruprecht's (*L. decumbens*), merged in *L. glauca* by Mr. Maximowicz, is also justified; another very distinct and remarkable form (*L. Clarkei*) is also for the first time defined.

Of the other Kurzian species (*L. spectabilis*), which Sir Joseph tentatively maintains, it is remarked that it does not perhaps differ from *L. glauca;* to that species, following Mr. Maximowicz, Sir Joseph refers the *L. cashmeriana* and *L. kunawarensis* of Royle, as well as a somewhat distinct form which he names *L. glauca* VAR. *sikkimensis*. At the same time Sir Joseph has indicated very clearly the differences that exist between *L. cashmeriana* and *L. kunawarensis*—differences that suggest specific distinction.

The plentiful accession of Himalayan material during the past ten years makes it necessary to recognise two forms more. One of these, from Phari, is very distinct and though in some respects related both to *L. globosa* and to *L. decumbens* it is in no sense intermediate between these two; its claim to specific rank appears to be as unimpeachable as the corresponding claim for *L. globosa* or *L. Clarkei*. The other is by no means so satisfactory. It combines certain characters of *L. cashmeriana*, which it resembles in habit, with some characters of *L. glauca*, from the Sikkim variety of which its flowers and from the North-west Himalayan variety of which its inflorescence are hardly distinguishable.

However much may be said, from the monographer's standpoint, in favour of the inclusion of *L. cashmeriana* in *L. glauca* there is no doubt that from the point of view of the field-botanist the location of *L. cashmeriana* and *L. glauca* VAR. *kunawarensis* in one species is not advisable. And the same may be said of the union of *L. glauca* VAR. *sikkimensis* and *L. spectabilis*. Even from the monographer's standpoint the writer is inclined to doubt whether much is gained by merging either *Lagotis cashmeriana* or *L. Stelleri* in *L. glauca;* in

the subjoined key these forms have accordingly been given specific rank.

The genus *Lagotis* was founded by Gaertner in 1770 (*Nov. Comm. Acad. Petrop.* xiv., pt. i., p. 533, t. xviii., f. 2) on a plant from Kamtschatka described by Gmelin (*Flor. Sibir.* iii. 219) in 1768 as a *Veronica*. A somewhat different form of the same species collected by Pallas was described by that author in 1776 (*Reise Prov. Russ. Reichs.* iii. 710, t. A, fig. 1) as *Gymnandra borealis*. The younger Linnæus united these two plants and referred them in 1781 to the genus *Bartsia* (Bartsia Gymnandra *Linn. f. Suppl. Plant.* 278); in this he was followed by Willdenow in 1800 (*Sp. Pl.* ed. iv. iii. 186), and by Pursh in 1814 (*Flor. Amer. Septen.* ii. 430). Lamarck, in the French edition of Pallas (1793), referred the species of this genus to *Paederota*.

In 1811, however, Willdenow (*Gesell. Naturf. Freunde Berlin Mag.* v. p. 390 *et seq.*) recognised the right to separate generic rank of the plants mentioned; for some reason Willdenow chose to employ the name *Gymnandra* of Pallas in preference to the older name *Lagotis* of Gaertner, being followed in this by Chamisso and Schlechtendal who monographed the genus in 1827 (*Linnæa* ii. p. 560, *et seq.*); by Choisy who monographed it again in 1848 (*DC. Prodr.* xii., 24 *et seq.*); by Ledebour who described the Russian species in 1849 (*Flor. Ross.* iii. 331, *et seq.*) and by Boissier who described the Oriental species in 1879 (*Flor. Orient.* iv. 527). Endlicher too in 1838 (*Gen. Plant.* 689); Meisner, between 1836–43 (*Gen. Plant.* i. 307, ii. 218); and Bentham and Hooker in 1876 (*Gen. Plant.* ii. 1129) used by preference the name *Gymnandra*. Dr. Ruprecht had endeavoured in 1845 (*Flor. Samojed. Cis.* 49) and again in 1870 (*Sert. Tianschan.* 64) to re-establish the true name; but it was not till 1881, that the indefensible usage was formally discredited at the instance of Mr. Maximowicz who, in his paper referred to above, restored the name *Lagotis*. In this he has been followed by Mr. Rolfe [*Journ. Linn. Soc.* xx. 349 (1884)] and by Sir Joseph Hooker in the *Flora of British India*, vol. iv; it is therefore to be hoped that the name *Gymnandra* may not re-appear in future lists.

Willdenow in his revision of 1811 recognised as many as eight species, all of which he figured; Chamisso and Schlechtendal, however, reduced these to three; in this they were followed by Choisy in his monograph. Maximowicz whose treatment touches, perhaps, the opposite extreme, reduced all of them to *L. glauca*. The writer's treatment differs slightly from that of all the authors mentioned; it recognises but two species in the group of forms figured by Willdenow, though it approaches that of Chamisso and of Choisy since one of the two species recognised admits of division into two varieties.

For convenience of consultation these reductions are here shown in tabular form.

Gmelin (1768).	Gaertner (1770).	Pallas (1776).	Linnæus fil. 1781). Willdenow (1800).	Willdenow (1811).	Chamisso and Schlechtendal (1827).	Choisy (1848).	Maximowicz (1881).	Present paper.
Veronica.	Lagotis.	Gymnandra.	Bartsia.	Gymnandra.	Gymnandra.	Gymnandra.	Lagotis.	Lagotis.
		borealis.	*Gymnandra* (in part).	1. *integrifolia.*				
				2. *altaica.*	3. *Pallasii.*	1. *borealis.*	*glauca*, subsp. *borealis*, var. *Pallasii.*	*glauca*, var. *Pallasii*; (L. Pallasii *Rupr.*)
				6. *elongata.*				
[n. 33].	*glauca.*		*Gymnandra* (in part).	7. *ovata.*	1. *Gmelini.*	2. *Gmelini.*	*glauca*, subsp. *borealis*, var. *Gmelini.*	*glauca*, var. *typica*; (L. glauca *Gaertner*).
				8. *reniformis.*				
				3. *minor.*				
				4. *dentata.*	2. *Stelleri.*	4. *Stelleri*	*glauca*, subsp. *borealis*, var. *Stelleri.*	*Stelleri.*
				5. *gracilis.*				

Endlicher and Meisner both followed their predecessors in referring the genus to the natural order *Scrophularineæ;* Choisy first placed it in its true natural order, being in this followed by all subsequent authors. In 1776 Pallas mentioned that his *Gymnandra* had already been named *Gerberia* by Steller. This name is also quoted by Choisy; Dr. Ruprecht, however, tells us [*Beitr. Pflanzenk. Russ. Reich.* vii. 69 (1850)] that the *Gerberia* of Steller is really a *Coptis*, not a *Lagotis*.

In order that the relationship of the two forms now described to those hitherto known may be more easily understood a key is appended in which are included all the species of *Lagotis* known to or recognised by the writer.

The writer in concluding this note would wish to express his obligation to Mr. Dyer, Director of the Royal Gardens, Kew, who has kindly permitted critical Indian specimens of *Lagotis* to be compared in Kew Herbarium, and his thanks to Mr. Rolfe of the Kew Staff by whom the necessary comparisons were made.

LAGOTIS Gaertn.

Key to the known species.

* Rhizomes elongated oblique, scapes usually as long as or longer than the leaves :—
  † Calyx of two oblong sepals, bracts so large as to conceal the flowers :—
    ‡ Bracts membranous; sepals slightly unequal :—
      § Heads globose; filaments slender as long as upper lip ... ... 1. *L. globosa.*
      § § Heads spicate; anthers subsessile ... 2. *L. decumbens.*
    ‡ ‡ Bracts herbaceous; sepals similar; (heads oval-oblong, filaments slender longer than the upper lip) ... ... 3. *L. pharica.*
  † † Calyx gamophyllous :—
    ‡ Bracts smaller than the large spathaceous galeate calyx which conceals the corolla ... 4. *L. Clarkei.*
    ‡ ‡ Bracts equalling or exceeding the dorsally plane 2-lobed calyx beyond which the corolla is far exserted :—
      ⊙ Lips of corolla shorter than the tube :—
        § Neck of rhizome naked; (small plants):—
          ¶ Filaments adnate to lower half to three-fourths of margin of upper lip; flower-heads ovate-oblong, leaves smooth, thin ... ... 5. *L. cashmeriana.*
          ¶ ¶ Anthers subsessile; flower-heads narrowly spicate, leaves subrugose ... 6. *L. crassifolia.*
        § § Neck of rhizome crowned with persistent, *not fibrous*, sheaths :—
          ¶ Basal sheaths thinly membranous dull, flower-heads ovate-oblong ... 7. *L. Stelleri.*

¶ ¶ Basal sheaths thickly membranous shining, flower-heads spicate :—
× Cauline leaves much smaller than radical ... ... 8. *L. glauca.*
× × Cauline leaves large, almost equalling lamina of radical .. 9. *L. spectabilis.*
⊙ ⊙ Lips of corolla as long as the tube ... 10. *L. brevituba.*
* * Rhizomes short premorse (crowned with *fibrous* sheaths); scapes leafless, shorter than the leaves; (calyx gamophyllous) :—
† Stolons 0; calyx winged; (disc reduced to one anterior lobe) ... ... 11. *L. Korolkowi.*
† † Stoloniferous; calyx not winged :—
‡ Glabrous; disc reduced to one anterior lobe ... 12. *L. stolonifera.*
‡ ‡ Puberulous; disc 4-lobed ... ... 13. *L. brachystachya.*

1. Lagotis globosa *Hook. fil. Flor. Brit. Ind.* iv. 558 (1885). Gymnandra globosa *Kurz, Journ. As. Soc. Beng.* xxxix. pt. 2, 80. t. 7, f. 1. (1870).

Western Tibet and Gilgit.

2. Lagotis decumbens *Rupr. Sert. Tianschan.* 64 (1870); *Hook. fil. Flor. Brit. Ind.* iv. 559 (1885). L. glauca sub-sp. australis *Maxim. Bull. Acad. Imp. Petersb.* xxvii. 523 (1881) *partim, pl. himal. exclus.*

Western Tibet and Tianschan Mts.

3. Lagotis pharica *Prain*; (Plate I.) leaves long-petioled, ovate-oblong, pinnately lobed, scape few-leaved; bracts equalling the flowers, ovate-oblong, imbricate, forming an ovate head.

South-Eastern Tibet: Tern-la, one day north of Phari, *Dungboo !*

Rootstock small, stoloniferous; roots very long and numerous. *Leaves* 1·5 in. long, ·75 in. wide, base truncate; petioles 2 in. long, narrow throughout. *Flowering stems* ascending, as long as the leaves, with a few leafy bracts near top. *Spike* ·75–1 in. bracts ·3 in. long, entire, obtuse, thickly herbaceous. *Flowers* ·3 in. *Sepals* 2, acute, equal and similar. *Lower corolla-lip* usually 3-cleft, upper 2-fid to -cleft. *Filaments* slender, exceeding the upper lip. *Style* included, stigma notched. *Fruit* narrowly oblong.

Nearly related to *L. globosa*, with which it agrees in having very long filaments and in having lobed leaves, though the leaves in this species are not so deeply cut; also to *L. decumbens* which it approaches in style of inflorescence. From both it differs in having thick, herbaceous, relatively smaller bracts. The lobing of the corolla, as a reference to the plate will show, is exceedingly variable in this species, particularly in the *upper* lip where each lobe may be again 2-fid, or at times even 3-fid. In most species of *Lagotis* the greatest variability is in the lower lip.

4. Lagotis Clarkei *Hook. fil. Flor. Brit. Ind.* iv. 559 (1885).

Sikkim; 13,000 to 16,000 feet. Yak-la *Clarke !* Tankra-la *G. Gammie ! King's Collector !* Pan-ding- la, near Jongri, *King's Collector !* Chumbi; at Ka-poop, *King's Collector !*

The flowers are reported variously as "light-yellow," "yellowish-green," and "white." The lower lip of the corolla is *entire*, ovate-oblong, rather wider than the upper lip.

5. Lagotis cashmeriana *Rupr. Sert. Tianschan.* 64 (1870). L. glauca sub-sp. australis *Maxim. Bull. Acad. Imp. Petersb.* xxvii. 523 (1881) *quoad pl. himal. partim.* L. glauca var. cashmeriana *Hook. fil. Flor. Brit. Ind.* iv. 559 (1885). Gymnandra cashmeriana *Royle* in *Benth. Scroph. Ind.* 47 (1835); *Ill. Himal.* 291, t. 73, f. 3 (1839); *Choisy* in *DC. Prodr.* xii. 25 (1848). G. Stelleri *Herb. Ind. Or. H. f. & T. vix Cham. & Schlecht.*

North-West Himalaya: Chamba to Kashmir.

M. Choisy (*loc. cit.*) felt disinclined to separate this form from *L. Stelleri*, and Drs. Hooker and Thomson when issuing their Indian Herbarium were even more decidedly of the same opinion. Unfortunately the writer has never had an opportunity of examining *L. Stelleri* of which there is no example at Calcutta. His friend Mr. Rolfe who, under instructions from Mr. Dyer, Director of the Royal Gardens, Kew, has kindly examined the specimens sent from Calcutta for comparison with the material in Kew Herbarium, writes:—"*Lagotis Stelleri* is "apparently distinct from *L. glauca* var. *cashmeriana* Hook. f. And whatever the "difference between *L. glauca* and the forms since distinguished from it, they are "more than mere synonyms. Possibly some are geographical forms."

In deference to this expression of opinion the writer, while following M. Choisy in keeping up *L. Stelleri*, regarding the claim of which form to specific rank that author expresses no doubt, has felt compelled to retain specific rank for *L. cashmeriana* also. For whatever its relationship to *L. Stelleri*, may be, there is, in the writer's opinion, no doubt that *L. cashmeriana* cannot, with any approach to either convenience or accuracy, be placed in *L. glauca*.

6. Lagotis crassifolia *Prain;* (Plate II) radical leaves ovate obtuse or subacute, base cuneate, margin serrate, petiole stout narrow; cauline similar but sessile; spike elongate, bracts ovate acute shorter than the flowers.

Sikkim: Tankra, *G. Gammie!* Phari: *King's Collector!* South-Eastern Tibet; Tern-la, one day north-east of Phari, *King's Collector!* prov. Tsang, *Lama Ujyen Gyatsko!*

Rootstock stout naked, with thick fleshy fibres. *Leaves* thickly fleshy, subrugose; radical 1–2 in. long, ½–1 in. wide, petiole 2—2½ in.; cauline ⅓–¾ in. *Flowering stems* several, 2–4 in. high, decumbent below, rather slender; spikes 1½–2½ in., bracts ⅓–½ in. *Calyx* dorsally plane, 2-lobed at tip, longer than tube of corolla and bracts. *Corolla* tube hardly ⅓ longer than lips, lower lip 2-fid, casually 3-fid. *Anthers* subsessile. *Style* included.

In size and appearance this resembles *L. cashmeriana*, but has very different flowers. As regards texture of leaves this approaches *L. brevituba;* as regards corolla it is almost exactly intermediate between *L. brevituba* and *L. glauca* var. *sikkimensis*. Under the system of treatment adopted by Mr. Maximowicz, this form would doubtless also be placed in *L. glauca*. Mr. Rolfe, however, who is one of the

foremost living authorities on this difficult natural order, agrees with the writer in considering the form distinct.

7. Lagotis Stelleri *Rupr. Beitr. Pflanzenk. Russ. Reich.* ii. 49 (1845); vii. 69 (1850). L. glauca var. Stelleri *Trautv. Act. Hort. Petrop.* v. 95 (1877); *Maxim. Mel. Biol.* xi. 298 (1881). Gerberia Stelleri *Pall. Mss.* ex *Lamk Voy. Pall.* ed. Gall. *App.* 225 (1793). Gymnandra minor *Willd. Gesell. Nat. Fr. Berlin Mag.* v. 393. t. 9. f. 3 (1811). G. dentata *Willd. loc. cit.* 394. t. 9. f. 4 (1811). G. gracilis *Willd. loc. cit.* t. 9. f. 5 (1811). G. Stelleri *Ledeb.* ex *Spreng. Syst. Veg.* ii. 773 (1825); *Cham. & Schlecht. Linnaea* ii. 563 (1827); *Choisy* in *DC. Prodr.* xii. 25 (1848); *Ledeb. Flor. Ross.* iii. 332 (1849). G. borealis var. inter Lenam et Oceanum lect. *Pall. It.* iii. 711 (1776).

Arctic Siberia and Arctic America.

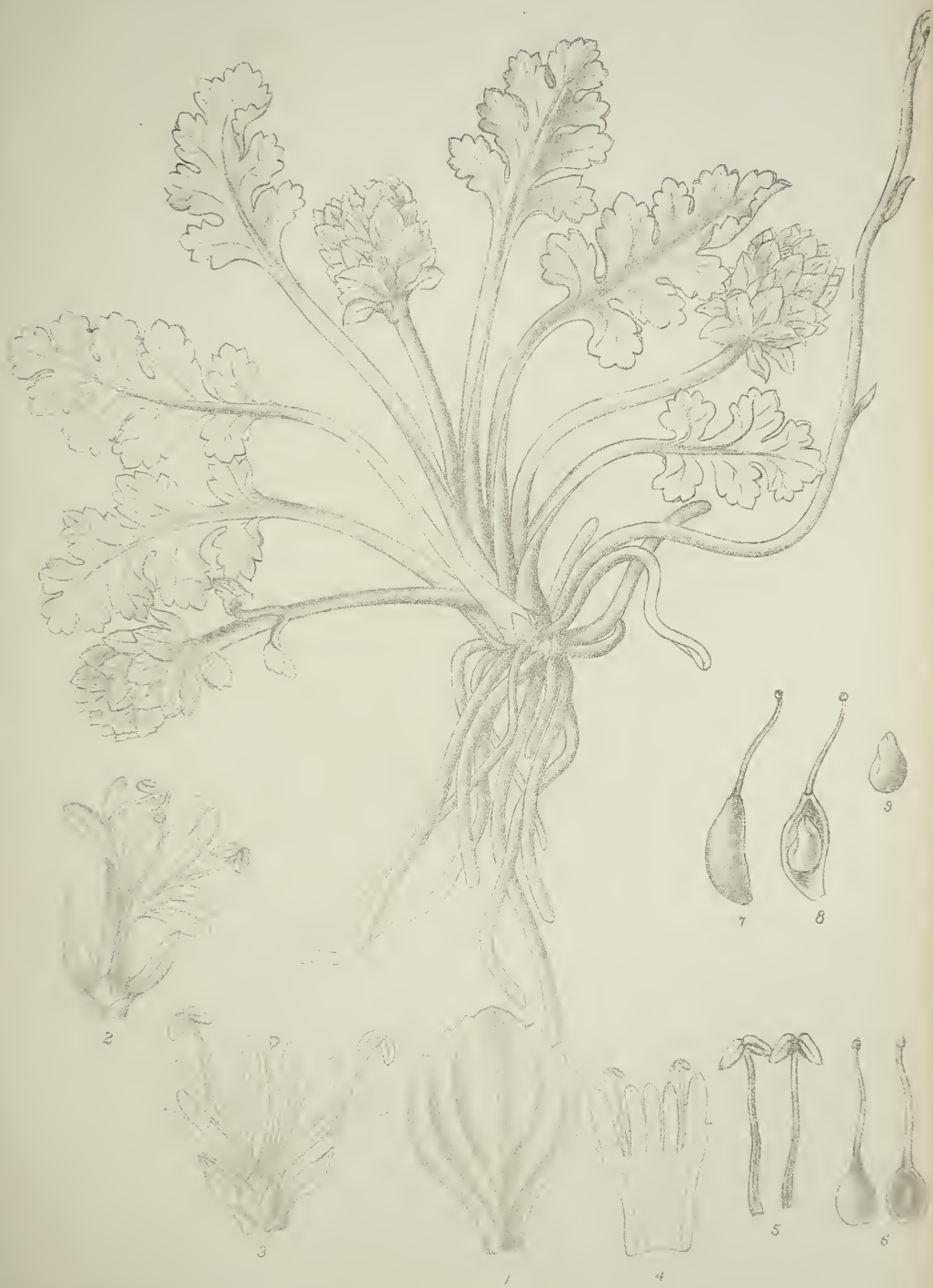
8. Lagotis glauca *Gaertn. ampl.*

Himalaya; Siberia; Mongolia; North-West America.

var. typica. Lagotis glauca *Gaertn. Nov. Comm. Acad. Petrop.* xiv. 534, t. 18 (1770); *Rupr. Sert. Tianschan* 64 (1870); *Rolfe, Journ. Linn. Soc.* xx. 349 (1884). Veronica foliis inferioribus ovatis crenatis, superioribus rotundis mucronatis, caule spica terminato *Gmel. Flor. Sibir.* iii. 219 n. 33 (1768). Bartsia Gymnandra *Linn. f. Suppl.* 278 (1781) *in parte; Willd. Sp. Pl.* iii. 186 (1800) *in parte*; *Pursh, Flor. Amer. Septen.* ii. 430 (1814). Gymnandra elongata *Willd. Gesell. Nat. Fr. Berlin Mag.* v. 395 t. 10. f. 7 (1811). G. ovata *Willd. loc. cit.* 395 t. 10. f. 8 (1811). G. reniformis *Willd. loc. cit.* 396 t. 10. f. 9 (1811). G. Gmelini *Cham. & Schlecht. Linnaea*, ii. 561 (1827); *Hook. Flor. Bor. Amer.* ii. 102 (1836); *Choisy* in *DC. Prodr.* xii. 25 (1848); *Ledeb. Flor. Ross.* iii. 332 (1849). G. borealis var. in Kamtschatka et ins. Beringii *Pall. It.* iii. 711 (1776). L. glauca var. typica *Trautv. Act. Hort. Petrop.* v. 95 (1877) *in parte.* L. glauca sub-sp. borealis var. Gmelini *Maxim. Mel. Biol.* xi. 298 (1881).

Eastern Siberia; Kamtschatka; North-West America.

var. Pallasii *Trautv. Enum. Pl. Schrenk.* 875 (1866). Lagotis Pallasii *Rupr. Sert. Tianschan.* 64 (1870); *Rolfe, Journ. Linn. Soc.* xx. 349 (1884). Bartsia Gymnandra *Linn. fil. Suppl.* 278 (1781) *in parte; Willd. Sp. Pl.* iii. 186 (1800) *in parte.* Gymnandra borealis *Pall. It.* iii. 710 t. A. f. 1 (1776); *Choisy* in *DC. Prodr.* xii. 25 (1848) *syn.* G. elongata *Willd. exclus.* G. integrifolia *Willd. Gesell. Nat. Fr. Berlin Mag.* v. 392 t. 9, f. 1 (1811). G. altaica *Willd. loc. cit.* 393. t. 9, f. 2 (1811); *Bunge* in *Ledeb. Fl. Altaic.* ii. 420 (1830). G. Pallasii *Cham. & Schlecht. Linnaea* ii. 564 (1827). G. longiflora *Kar. & Kir. Enum. Pl. Soongar.* 148 (1840). Paederota borealis *Lamk. Voy. Pall.* ed. Gall. *App.* 227 (1793). Lagotis glauca sub-sp. borealis var. Pallasii *Maxim. Mel. Biol.* xi. 298 (1881).



Lith. by A. L. Sing

CARDIOSPERMUM HALICACABUM, Prain.

Drawn by A. L. Singh.

LAGOTIS CRASSIFOLIA, Prain.

Lith. by K. P. Dass.